

In the claims:

Please amend the claims as follows:

a! 1. (currently amended) ~~A bacterial~~ An *E. coli* host cell comprising a nucleic acid sequence comprising a promoter and nucleic acid sequence encoding a heterologous polypeptide that catalyzes a reaction in a metabolic pathway which produces an isoprenoid; the nucleic acid sequence being operably linked to the promoter which is ~~controlled by a response regulator protein bound by ntrC~~; the host cell being genetically modified by deletion or mutation of glnL such that the promoter is regulated by acetyl phosphate in the absence of nitrogen starvation.

2. (canceled)

3. (canceled)

4. (canceled)

5. (original) The host cell of claim 4 wherein the promoter is glnAp2.

6. (canceled)

7. (canceled)

8. (canceled)

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9. (currently amended) A An E. coli host cell comprising a first expression cassette comprising a *glnAp2* promoter and a nucleic acid sequence encoding a first enzyme that catalyzes a reaction in a pathway that produces an isoprenoid required for biosynthesis of a heterologous metabolite; the nucleic acid sequence being operably linked to the promoter which is regulated by acetyl phosphate in the absence of nitrogen starvation; and nucleic acid sequences expressing other enzymes in the isopenoid-producing pathway required for biosynthesis of the metabolite.

10. (canceled)

11. (currently amended) The host cell of claim 10 ~~9~~ wherein the isoprenoid is a carotenoid.

12. (currently amended) The host cell of claim 10 ~~9~~ wherein the isoprenoid is lycopene, b-carotene, astaxanthin, or one of their precursors.

13. (currently amended) The host cell of claim 10 ~~9~~ wherein the first enzyme is isopentenyl diphosphate isomerase, geranylgeranyl diphosphate synthase, or 1-deoxyxylulose 5-phosphate synthase.

14. (original) The host cell of claim 9 wherein the first enzyme is phosphoenolpyruvate synthase.

15. (canceled)

16. (canceled)

17. (canceled)

18. (canceled)

19. (canceled)

20. (canceled)

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21. (currently amended) The host cell of claim ~~10~~ 13 wherein the host cell further contains a second expression cassette comprising a nucleic acid sequence encoding a phosphoenolpyruvate synthase operably linked to a *glnAp2* promoter ~~which is regulated by acetyl phosphate concentration.~~

22. (withdrawn)

23. (withdrawn)

24. (currently amended) A kit comprising a nucleic acid sequence containing a *glnAp2* promoter and a restriction enzyme polylinker located 3' of the promoter such that a sequence inserted into the polylinker is operably linked to the promoter controlled by a response regulator protein such that the promoter is regulated by acetyl phosphate in a defined host cell; and the defined *E. coli* host cell which is genetically modified by deletion or mutation of a *glnL* histidine protein kinase gene.

25. (currently amended) A nucleic acid sequence comprising a promoter and a sequence encoding a biosynthetic enzyme that catalyzes a reaction in a metabolic pathway which produces an isoprenoid required for the production of a first metabolite, the sequence being operably linked to the promoter which is ~~regulated by~~ bound by *ntrC* and responds to acetyl phosphate in the absence of *glnL* protein activity ~~a second metabolite whose concentration is indicative of availability of a precursor for the biosynthesis of the first metabolite.~~

26. (canceled)

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27. (canceled)

28. (original) The nucleic acid sequence of claim 27 wherein the isoprenoid is a carotenoid.

29. (original) The nucleic acid sequence of claim 28 wherein the isoprenoid is lycopene, b-carotene, astaxanthin, or one of their precursors.

30. (canceled)

31. (canceled)

32. (canceled)

33. (canceled)

34. (currently amended) The nucleic acid sequence of claim 25 ~~33~~ wherein the promoter is *glnAp2*.

35. (currently amended) The nucleic acid sequence of claim 34 ~~27~~ wherein the biosynthetic enzyme is isopentenyl diphosphate isomerase, geranylgeranyl diphosphate synthase, 1-deoxyxylulose 5-phosphate synthase, or phosphoenolpyruvate synthase.

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36. (new) A *E. coli* host cell comprising

- (i) a genetic alteration inactivating the *glnL* gene;
- (ii) a nucleic acid sequence comprising a coding sequence encoding a phosphoenol pyruvate synthetase (pps) and an operably linked *glnAp2* promoter that is regulated by *ntrC* and acetyl phosphate; and
- (iii) nucleic acid sequences encoding a geranylgeranyl diphosphate synthase, a phytoene synthase, and a phytoene desaturase.

37. (new) The host cell of claim 36 further comprising a nucleic acid sequence that expresses isopentenyl diphosphate isomerase.

38. (new) The host cell of claim 37 wherein the nucleic acid sequence that expresses isopentenyl diphosphate isomerase is operably linked to a *glnAp2* promoter.

39. (new) The host cell of claim 36 wherein the host cell can produce lycopene.

40. (new) The host cell of claim 39 wherein the host cell can produce greater than 5 mg L⁻¹ lycopene.

41. (new) A nucleic acid sequence comprising a *glnAp2* promoter responsive to acetyl phosphate concentration and a coding sequence encoding a phosphoenol pyruvate synthetase (pps) enzyme, wherein the coding sequence is operably linked to the *glnAp2* promoter.

42. (new) The host cell of claim 1 wherein the heterologous polypeptide is a phosphoenolpyruvate synthase.

43. (new) The host cell of claim 5 wherein the heterologous polypeptide is a phosphoenolpyruvate synthase.

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44. (new) The host cell of claim 43 wherein the isoprenoid is lycopene and the host cell expresses a geranylgeranyl diphosphate synthase, a phytoene synthase, and a phytoene desaturase.

45. (new) The host cell of claim 43 wherein the host cell can produce greater than 5 mg L⁻¹ lycopene.

46. (new) The host cell of claim 43 wherein the cell has an inactivating mutation in a pyruvate kinase.

47. (new) The host cell of claim 43 wherein the cell has an inactivating mutation in a phosphoenolpyruvate carboxylase.

48. (new) The host cell of claim 43 wherein the cell further overexpresses a phosphoenolpyruvate carboxykinase.

49. (new) The host cell of claim 44 wherein the host cell can produce greater than 5 mg L⁻¹ lycopene.

50. (new) A method of producing lycopene, the method comprising:
providing the host cell of claim 44; and
culturing the host cell under conditions that include nitrogen.

51. (new) The method of claim 50 further comprising culturing the host cells to late-logarithmic growth.
